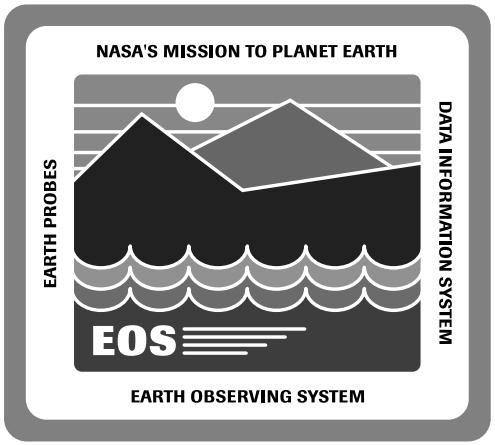
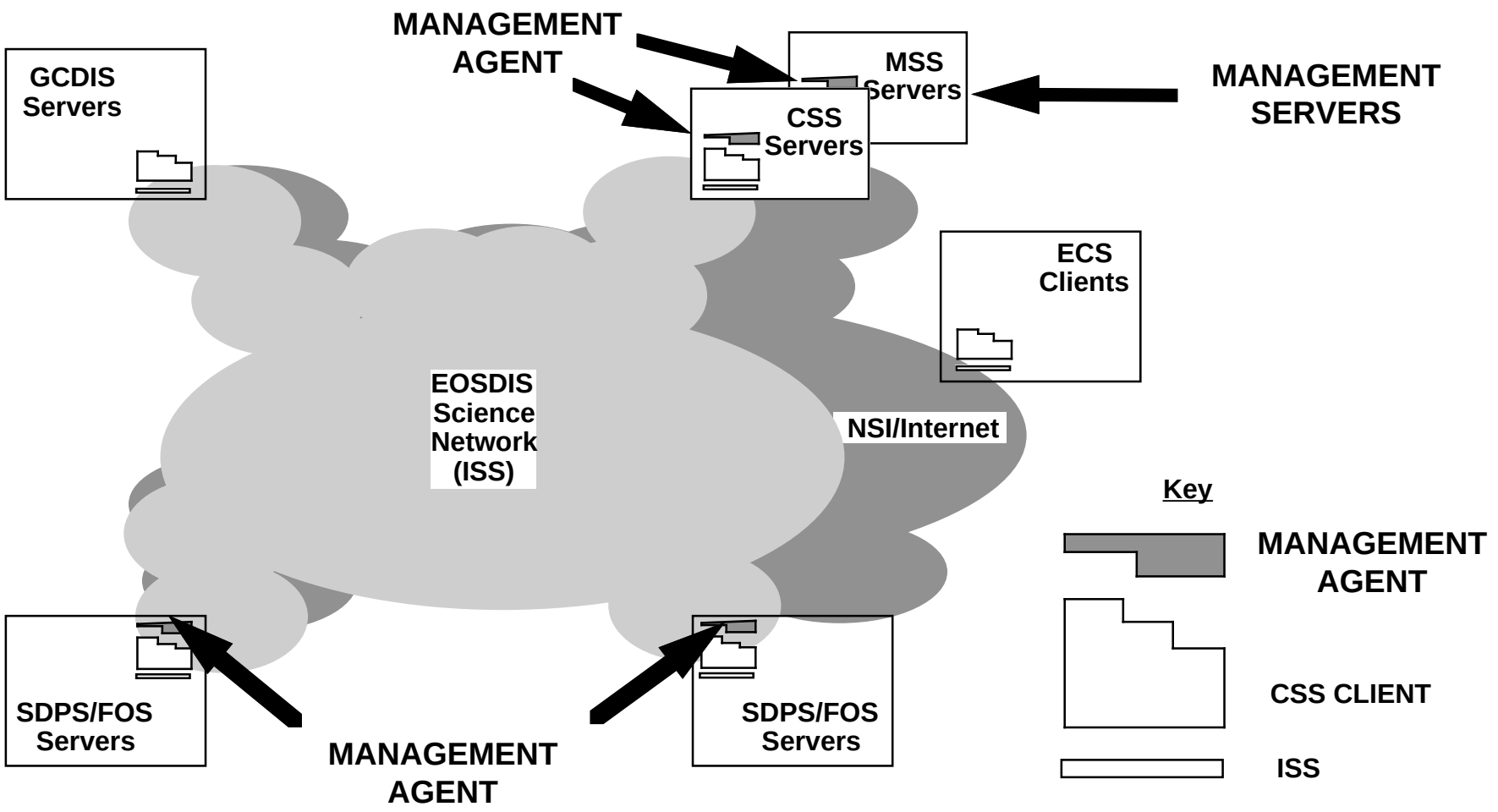


Management Subsystem (MSS)

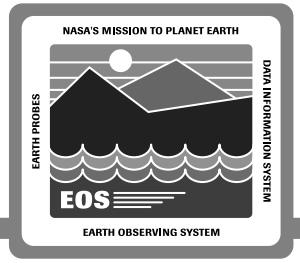
Chris Smith

System Design Review - 29 June 1994

MSS Context


MANAGEMENT AGENT
MSS Servers
MANAGEMENT SERVERS
GCDIS Servers
CSS Servers
ECS Clients
EOSDIS Science Network (ISS)
NSI/Internet
Key
MANAGEMENT AGENT
CSS CLIENT
ISS
SDPS/FOS Servers
SDPS/FOS Servers
MANAGEMENT AGENT

MSS Roadmap



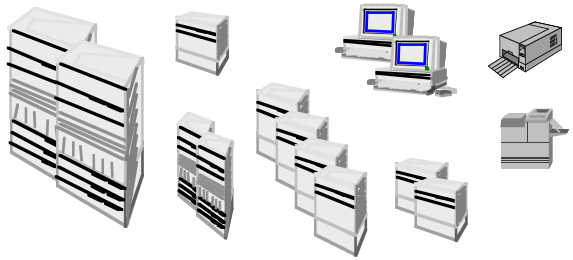
- **Enterprise Management**
- **MSS Role**
- **Management Architecture Selection**
- **MSS Decomposition**
- **Management Service Distribution**
- **Network Management Coordination**
- **Physical Context**
- **Synthesis**
- **Scalability & Evolvability**

SDS 6.6.3

Enterprise Management

System Managers (Operators)

DAAC Manager
Maintenance Staff
Operations Staff
Flight Controllers
SMC Staff



Management Applications

- Policy
- Accounting
- Fault
- CM/ILS
- Security
- Scheduling
- Performance
- Other

Common Management Services

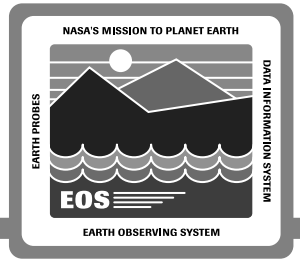
Managed Objects

- Devices
- Systems Software (including comm stacks)
- Applications

Managed Object "Agents"

Management Communications & Protocol Services

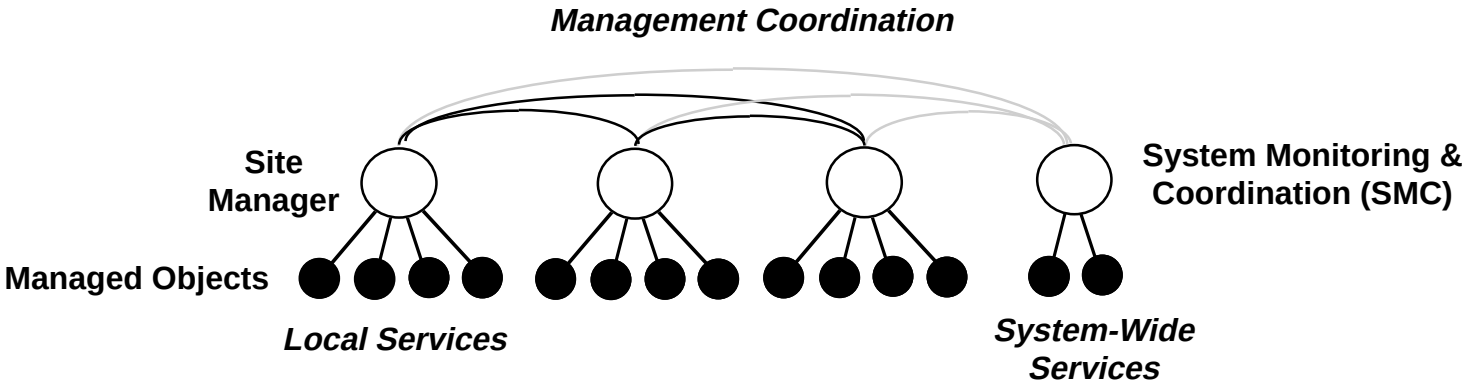
MSS Role



ECS Needs	MSS Capability	MSS Approach
• DAAC Autonomy with Consistent Management	• Common Management Tools in each Domain	• Federated Design with one Monitoring/Coordination Node
• Policy Neutrality	• Configurable, Transparent Access to All Services	• Use of ORB, Common Facilities and Object Services for Managed Objects
• No Single Point of Failure	• Management Service Distribution	• No Centralization for Services Affecting User Access
• Minimize Development, Maximize COTS	• Early Network Management with Migration to Enterprise Management	• DME 2.0-Based Framework and SNMP with Migration to Object Framework, SNMP2 and XMP
• Evolvability & Scalability	• Allow More and Types of Providers, Users and Products to be Added (GCDIS/UserDIS)	• Federated Design, Extensible Agents, Management APIs, Object Management Paradigm and Management Workstations

SDS 6.6.1

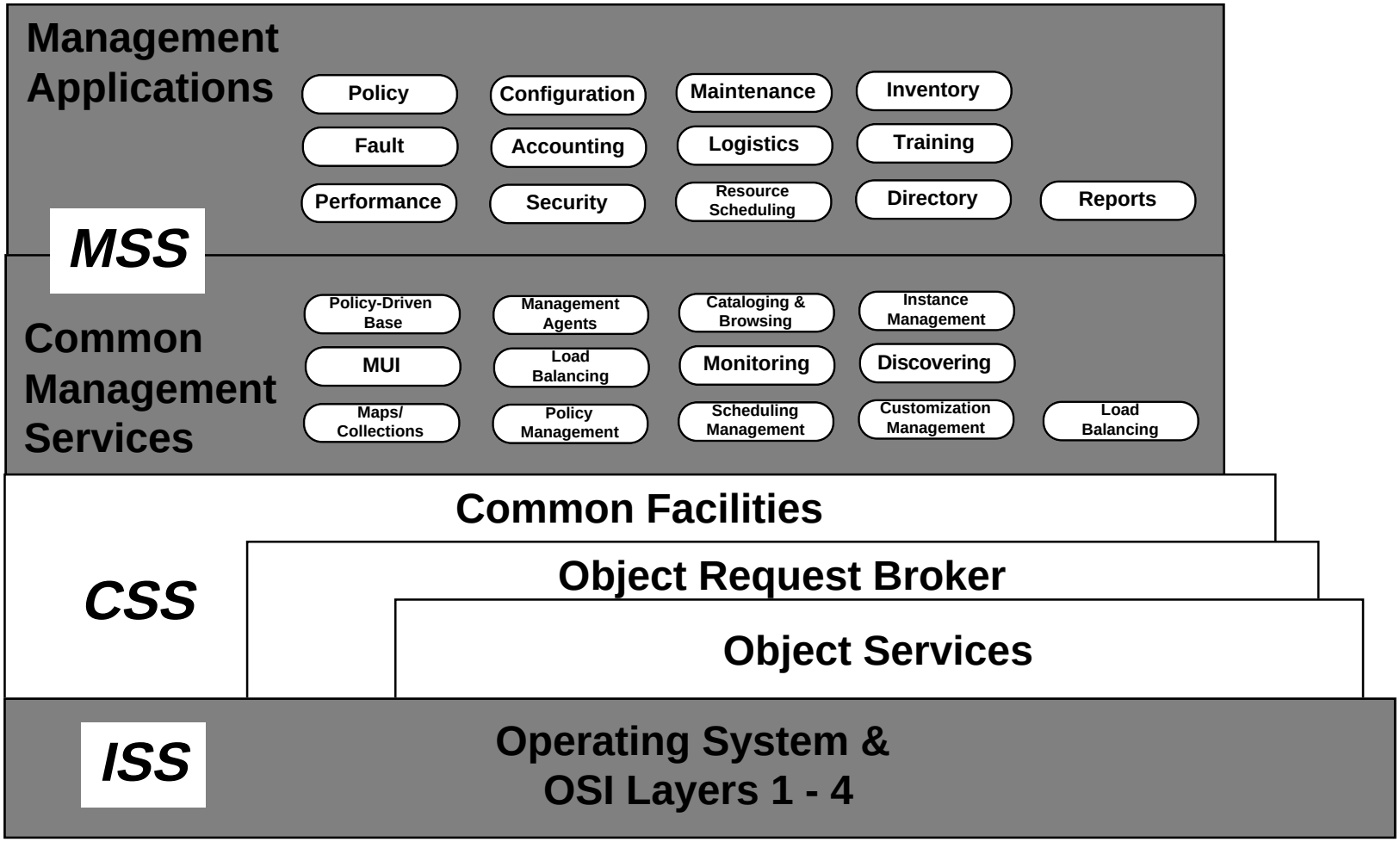
Management Architecture Selection



- **Federated Architecture Supports DAAC Autonomy and Distribution of Authority**
- **Each Site Manages Objects in Its Own "Domain" (*Local Services*)**
- **System Monitoring and Coordination (SMC) Node Provides *System-Wide Services* for the "System Domain"**
- **Common Tools, with Policy-Based Configurability, Allow Access to Any/All Management Services**

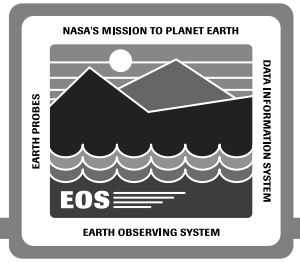
SDS 6.3.4

MSS Decomposition



SDS 6.6.1

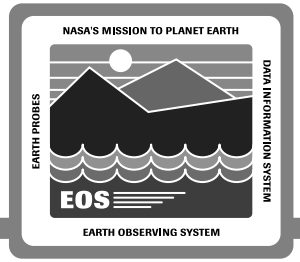
Management Service Distribution



- **Sites Have Complete Control of Local Resources**
- **SMC Maintains System-Wide Integrity and Commonality Among Sites**
- **Coordinated with SOFT, DAAC Managers & Architecture Working Group**

Service	Sites	
Policy	✔ Iteration with SMC ✔ Procedure Development ✔ Procedure Implementation	✔ Flowdown from NASA and Tailoring to ECS Through Iteration with Sites ✔ Compliance Monitoring
Fault	✔ Site Monitoring ✔ Detection ✔ Diagnosis ✔ Recovery	✔ System-Wide Fault Monitoring ✔ Fault Trend Analysis and Support
Security	✔ Authentication & Authorization ✔ Intrusion Detection, Data Integrity/ Privacy ✔ Site Audits	✔ Policy Compliance Monitoring ✔ System-Wide Audits
Performance	✔ Collect and Analyze Data ✔ Optimize/Tune to Service-Level Agreements (SLAs) ✔ Assess Site Trends/Capacity Planning	✔ System-Wide Trend Analysis/Capacity Planning ✔ Verification/Promulgation of SLAs
Accounting	✔ User registration/Account Set-up ✔ Account Deductions/Tracking ✔ Audit trail ✔ Price Estimates	✔ Consolidated Billing and Receipts Processing ✔ Accounts Receivable/Payable
CM / ILS	✔ Site Inventory ✔ Site Maintenance ✔ Site CM Baseline ✔ Site Training Management	✔ System-Wide Coordination/Monitoring of Inventory, Maint. and Training ✔ System CM Baseline Maintenance
	✔ Consider Schedule Policies/Priorities in Planning ✔ Schedule Own Resources ✔ Coord Schedules with DAACs & SMC	
Network Management Roles	✔ Manage Site's ECS LAN(s) (ESN) ✔ Coordinate w/SMC on ECS WAN and External Provider I/Fs	✔ Manage ECS WAN (ESN) ✔ Coordinate w/Sites on ECS WAN and External Provider I/Fs

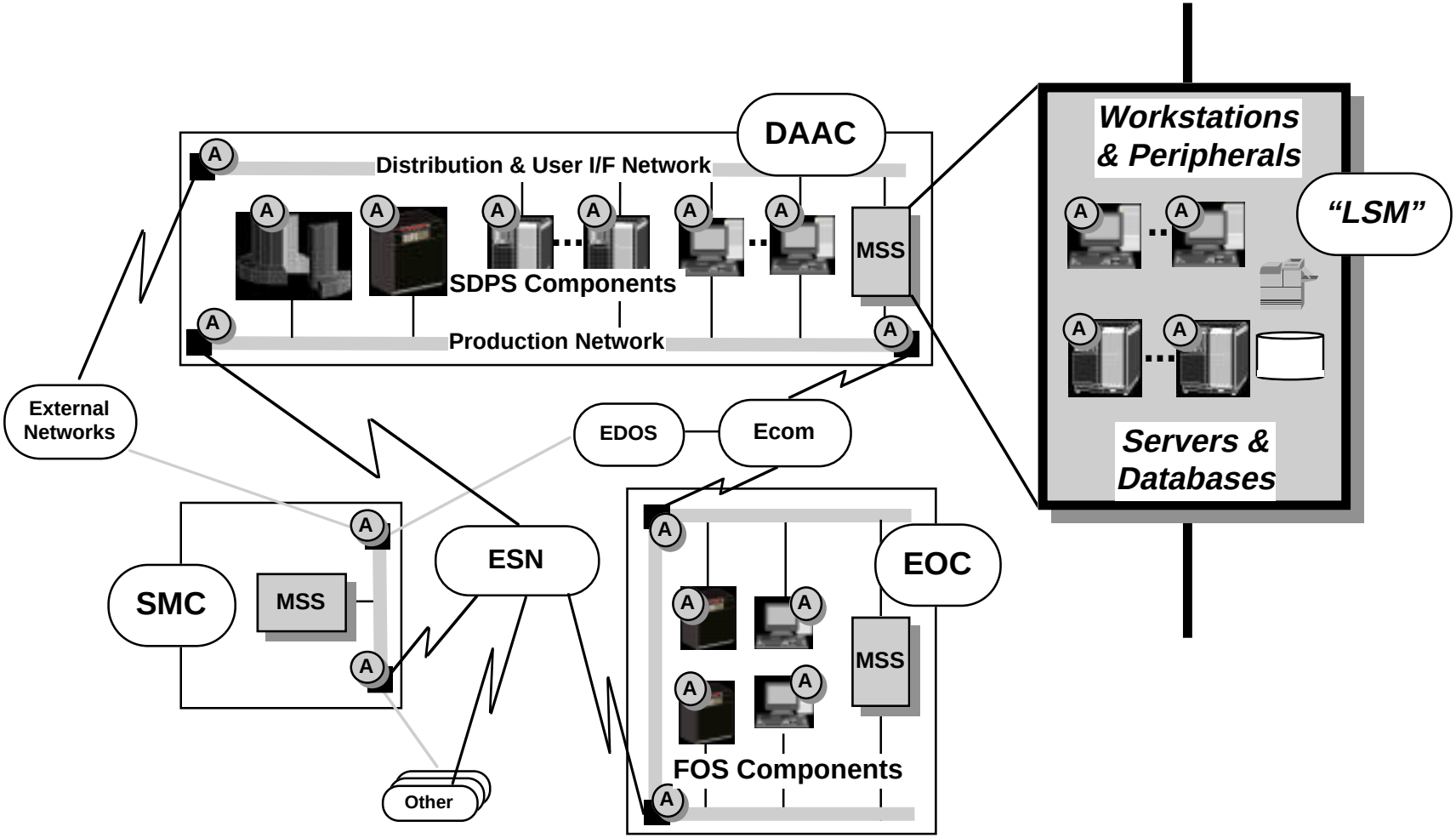
Network Management Coordination



- **Shared network performance and usage information and analyses**
- **Cooperative fault isolation and diagnosis with network providers**
  - **Providers notify SMC and affected site(s) regarding failures (ECS independently works toward fault isolation)**
  - **When possible, providers' ECS site routers will be jointly monitored by ECS and provider using network management tools**
- **Automated practices**
  - **Fault notification sent in standard, parsable format**
  - **Access to additional status information available on request (e.g., via access to trouble-ticket databases)**

SDS 6.6.1.2

Physical Context



Synthesis

Configuration Items (CIs)

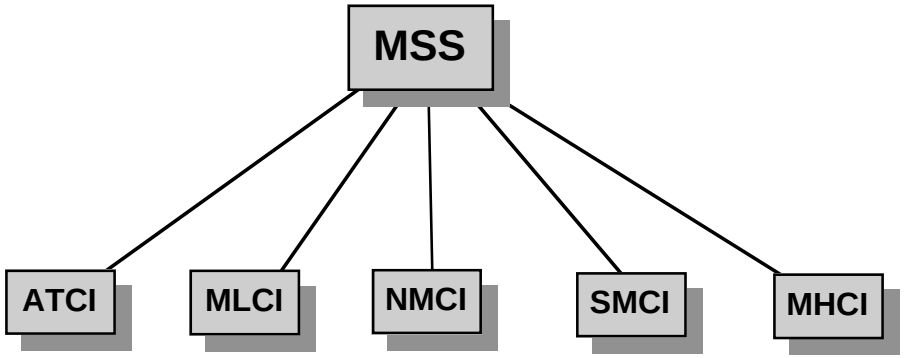
ATCI - Agent

MLCI - Management Logistics

NMCI - Network Management

SMCI - System Management

MHCI - Management Hardware



MSS Service Super Classes

		ATCI	MLCI	NMCI	SMCI	MHCI
Management Applications	**Provide application layer network and system management services to system managers (operators)**		●	●	●	○
Common Management Services	**Support framework supporting applications and managed objects**	●		●	●	○
Managed Object Template Services	**Implement the management information model for managed objects**	●				

Scalability & Evolvability

	Design Approach
More Providers/Sites	• Federation allows additional nodes (DAACs/SCFs) to be added without redesign
Bigger Providers/Sites	• Distribution of routine monitoring to agents • Management APIs provide open service access
More Users	• Low-overhead guest status for majority of users • DAACs scale independently without redesign
Increased Automation	• Management workstations offload servers • Object orientation enables management application change or new addition
New Resource Types	• Object management paradigm supports new types of managed objects